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## BLACK COCKATOOS AND PINE PLANTATIONS

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The establishment of large areas of *Pinus pinaster* forests in the South-west portion of Western Australia has had a most interesting effect on the population density of the White-tailed Black Cockatoo (*Calyptorhynchus baudinii*) in this region. Under natural conditions in the heavy forested corner of the South-west, these birds congregate in flocks of from 12 to 30 and rarely is a greater number met with. This limitation is, of course, imposed by the amount of food material available under natural conditions. As soon as the food supply is stepped up in any given locality, the cockatoo population increases in a most amazing way. The writer has seen flocks of these birds over Forests Department plantations estimated to contain 5,000 to 6,000 individuals.

All of the department's pine plantations are visited by the birds, including the four metropolitan ones. These latter are the Collier Plantation, South Perth (which is within three miles of the Perth Town Hall), 1,000 acres; Somerville Plantation, Apple-



Examples of *Pinus pinaster* cones in natural state (three on left) and after removal of seeds by Cockatoos (four on right).

cross, 2,000 acres; Scaddan Plantation, Mt. Lawley, 200 acres; and Gngangara Plantation, 12 miles from Perth, between Wanneroo and West Swan, 2,500 acres. Planting first started in 1926 and though I have no records as to when the cockatoos first started to visit the plantations, it could not have been before the trees started to seed, which they do seven years after planting.

These birds have found an excellent food material in *Pinus pinaster* seed. These seeds are enclosed in a very hard woody cone, and it is most fascinating to watch the birds at work on them. The cone is torn from the tree and grasped in one foot, the other of course retaining the bird's hold on the tree. With the beak the cockatoo starts near the base of the cone to tear the bracts off. Under each bract there are two seeds and these are extracted one at a time. When the wing is removed the hard outer coating of the seed is split neatly and discarded, the thin brown inner tissue follows, and then the white kernel is swallowed. All this is done with the beak while one foot grasps an insecure perch on a swaying pine and the other holds the cone, which may weigh nearly a pound. A poor human can make no impression on these cones even with a knife—an axe or hatchet is required. An examination of a bird's crop shows it to be packed with white kernels, each one perfect and undamaged.



*Pinus pinaster* cones, from left to right: two unopened cones; three cones which have been opened by Cockatoos and the seed extracted; one cone which has opened naturally and shed its seed. Below, on the plates, are seeds of *P. pinaster* with and without wings.

The cockatoos stay on the plantations until all the cones have been stripped from the trees and then disperse again into small bands. They usually commence to leave about August and September and re-appear about February and March. It will be interesting to see if, when further large areas of this pine are planted, the birds will ever leave the plantations.

There is another rather interesting side to the matter. The Forests Department collects its seed requirements of this pine from its own plantations and, some years ago, it became increasingly evident that, unless something was done to discourage the cockatoos, we would not obtain any seed at all. The birds remove most of the cones before they are properly ripe and this presented a serious problem. Very reluctantly application was made to the Fisheries and Game Department for permission to shoot them, our reasons being fully set out. This was granted, and we managed to collect some seed though only a small amount. It was then found that it was possible to keep the birds away by just firing guns into the air, and killing them was unnecessary. It then occurred to the writer that it might be possible to mature the seed in the immature cones which fell to the ground—the cockatoos drop on an average about one cone in five. These dropped cones were gathered up, placed in heaps and covered with pine needles and left to mature. At the same time tests were carried out, cones being gathered from the trees every month from March to October. These were stored in the same way as those gathered up. About January the test cones were dried out, the seed extracted and tests made of each month's collection. It was found that the seed matured quite satisfactorily and gave excellent germination percentages for all months. So now, instead of the cockatoos being a serious pest, we have them working for us. We obtain from 300 to 500 pounds of seed every year from the one cone in five that the birds drop, and they have very materially reduced the cost of collection. The men go through and collect the cones as soon as the crop begins to fall. If we leave it longer than this, the cockatoos, driven by hunger, overcome their fear of alighting on the ground and come down and clean up every single cone. They become an easy prey for foxes when doing this, as the feathers one finds about testify.

When we were re-opening some old location boundaries in the vicinity of the 65 mile peg on the Great Northern Highway, between Bindoon and New Noreia, a number of nests of the White-tailed Black Cockatoo were located. When blazing the trees with an axe a scambling noise would be heard up in the crown and on looking up a Black Cockatoo would be seen emerging from a cavity in the tree. I was not able to examine any of the nests located and so am not able to say what stage the young had reached. Three nests were found in wandoo trees (*Eucalyptus redunca* var. *elata*) and two in marri trees (*Eucalyptus calophylla*). The date was October 5 and 6, 1948.